



## Antibiotic Prescription Variation Down to Individuals



Variation in antibiotic prescription is mostly due to the different routines of healthcare providers rather than differences in patient characteristics, practice standards at different hospitals or the clinical setting, according to a study published in the *Annals of Internal Medicine*. 10 percent of health care providers write an antibiotic prescription for nearly every patient (95 percent or more) who walks in with a cold, bronchitis or other acute respiratory infection (ARI). At the other extreme, 10 percent of providers prescribe antibiotics during 40 percent or fewer patient visits.

The research, supported by the Centers for Disease Control and Prevention and led by the Veterans Affairs Salt Lake City Health Care System and the University of Utah, is an important step toward understanding the problem of antibiotic overuse.

The study found that 68 percent of all visits for ARI resulted in an antibiotic prescription. The precise description of the practice patterns of individual healthcare providers is possible due to applying advanced statistical analysis to big data housed within the VA electronic health record (EHR). The researchers analysed 1,044,523 patient visits for ARIs at 990 clinics or emergency departments at 130 VA medical centres across the U.S. from 2005 - 2012. The overall proportion of visits in which providers prescribed antibiotics increased by two percent during the eight-year period. There was also a 10 percent increase in the proportion of broad-spectrum antibiotics (macrolides) prescribed despite the fact that guidelines recommend against them as a first line of defense for most respiratory infections.

An analysis of 480,875 visits and 2,594 providers who treated at least 100 patients for ARI showed that 59 percent of the variation in how often antibiotics were prescribed was attributed to the habits of individual providers. 28 percent of the variation was related to differences in practice among clinics, and 13 percent to differences in practice among hospital centres. The prescribing patterns of individual providers existed after accounting for patient characteristics such as age, sex, and other illnesses.

Barbara Jones, MD, MS, assistant professor of internal medicine at the University of Utah and clinician at the VA Salt Lake City Health Care System, said that while physicians receive similar training, they practise differently. "We were able to see that even if Dr. A works just down the hall from Dr. B they may practise medicine very differently. The extent of this variation has been hard to measure in the past." The key to reducing antibiotic overuse in the future is understanding and improving decision-making by providers, suggested Jones: "We'd like to use this research to start a conversation among providers and patients about antibiotic prescribing for ARIs, and share the approaches of providers who are prescribing antibiotics less frequently with those who may be prescribing too often."

Matthew Samore, MD, professor of internal medicine at the University of Utah and director of the

Informatics, Decision Enhancement, and Analytic Sciences (IDEAS) Center at the Salt Lake City VA, acknowledged that face-to-face conversations about prescribing can be difficult. However, the EHR offers an opportunity to connect decisions to the scientific evidence, and his team is looking at implementing decision support tools.

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